

REMARKS

Claims 1 and 3-19 are pending in this application. Non-elected claims 15 and 16 have been withdrawn from consideration by the Examiner. By this Amendment, claims 1, 7, 8 and 18 are amended, and claim 2 is canceled. Support for the amendments to the claims may be found, for example, in the original claims. No new matter is added.

In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

I. Claim Objection

The Office Action objects to claims 7 and 18 due to informalities. By this Amendment, claims 7 and 18 are amended to obviate the objection. Accordingly, reconsideration and withdrawal of the objection are respectfully requested.

II. Obviousness-Type Double Patenting

The Office Action provisionally rejects claims 1-14 and 17-19 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 18-20 of copending Application No. 10/552,482. Without admitting to the propriety of the rejection, and in the interest of advancing prosecution, Applicant is simultaneously filing herewith a Terminal Disclaimer over the cited reference, thus obviating the rejection. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

III. Rejection Under 35 U.S.C. §102

The Office Action rejects claims 1, 9 and 17 under 35 U.S.C. §102(b) as being anticipated by Lin et al., "Synthesis and Epoxy Curing of Mannich Bases Derived from Bisphenol A and Poly(oxyalkylene)diamine" ("Lin"). By this Amendment, claim 1 is amended to incorporate the subject matter of non-rejected claim 2, rendering the rejection moot. Nevertheless, Applicant submits the following comments.

By this Amendment, claim 1 is amended to recite an epoxy resin composition comprising "at least one Mannich base and after curing at a temperature between 5°C and 60°C has a glass transition temperature of more than 80°C, wherein the Mannich base is prepared using a phenolic compound of the formula (I) or (II)." Formulae (I) and (II) represent m-cresol or m-xylenol compounds. The claimed epoxy resin compositions comprise only m-cresol or m-xylenol phenolic compounds, among many known phenols, because such compounds exhibit superior and unexpected results over their respective o- and p- isomers and other phenols. See Examples and Table 5.

Lin does not disclose that the curing of the epoxy resin composition occurs at a temperature between 5°C and 60°C. Instead, Lin discloses curing the epoxy resin in a heated differential scanning calorimeter (DSC). See page 617 (the subheading "Epoxy Curing in DSC" describes that curing occurs in the DSC). Specifically, the uncured epoxy resin mixture is mixed at room temperature until the mixture is homogenized and the homogenized mixture is placed in a DSC where the mixture is heated at a curing temperature, which is much greater than 5-60°C. Id. Only after the mixture is cured in the DSC, the glass transition temperature (Tg) of the mixture is measured. Id; see also Table II. Thus, the epoxy resin mixture of Lin is not cured at a temperature between 5°C and 60°C.

Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

IV. Rejections Under 35 U.S.C. §102/103

A. JP '498

The Office Action rejects claims 1, 9-13 and 17 under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as having been obvious over JP 6-172498 ("JP '498"). By this Amendment, claim 1 is amended to incorporate the subject

matter of non-rejected claim 2, rendering the rejection moot. Nevertheless, Applicant submits the following comments.

As discussed above, claim 1 is directed to epoxy resin compositions comprising m-cresol or m-xylenol phenolic compounds. JP '498 does not disclose a Mannich base prepared by m-cresol or m-xylenol phenolic compounds. Instead, JP '498 discloses a Mannich base prepared by mixing a cyclic diamine, monohydric phenol and formaldehyde. See paragraph [0011]. JP '498 merely discloses "phenol, cresol, a xylenol, carvacrol, Timor, naphthol" as suitable phenolic compounds. Id. Nowhere in JP '498 does it disclose m-position isomers of the phenolic compounds, such as m-cresol or m-xylenol.

Furthermore, the Office Action, at page 5, asserts that "[t]he claimed glass transition temperature of more than 80°C after curing at a temperature of between 5°C and 60°C is not an affirmative limitation since the claims are drawn to a composition wherein the curing is merely the ultimate intended processing thereof." The Office Action further asserts that the cured composition of the reference inherently exhibits a Tg within the claimed range.

Applicant respectfully disagrees.

The claimed Tg is an affirmative limitation because exhibiting a Tg of more than 80°C after curing at a temperature between 5°C and 60°C is an unexpected characteristic of the claimed epoxy resin composition over conventional epoxy resins, such as the one disclosed JP '498. See specification at page 1, line 30 to page 2, line 4. The Office Action does not establish, and JP '498 does not suggest, that the epoxy resin of JP '498 has a Tg of more than 80°C after curing at a temperature between 5°C and 60°C. In fact, as acknowledged by the Office Action, there is no disclosure in JP '498 that describes how the Mannich bases are prepared, e.g., the curing temperature. Thus, the epoxy resin of JP '498 does not disclose an epoxy resin having a Tg of more than 80°C after curing at a temperature between 5°C and 60°C.

Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

B. Golden and WO '659

The Office Action rejects claims 1, 9-11 and 17 under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as having been obvious over U.S. Patent No. 5,001,193 to Golden ("Golden") or WO 00/01659 ("WO '659"). By this Amendment, claim 1 is amended to incorporate the subject matter of non-rejected claim 2, rendering the rejection moot. Nevertheless, Applicant submits the following comments.

(i). Golden

Golden does not disclose a methyl as the alkyl group of the phenolic compound of the Mannich base, much less m-cresol or m-xylenol. Instead, Golden merely discloses alkylated phenols as suitable phenolic compounds. See col. 3, line 67 to col. 4, line 1.

Furthermore, similar to JP '498 (discussed above), there is no disclosure in Golden that describes how the Mannich bases are prepared, e.g., the curing temperature. Thus, Golden does not disclose an adhesive having a Tg of more than 80°C after curing at a temperature between 5°C and 60°C.

(ii). WO '659

WO '659 does not disclose a Mannich base that is prepared by using m-cresol or m-xylenol phenolic compounds. Instead, WO '659 discloses Mannich bases comprising C15-Alkylphenol (cardanol), which is a completely different phenolic compound from that of claim 1.

Furthermore, the present application is directed to epoxy resin compositions that can be cured at a temperature between 5°C and 60°C while exhibiting high Tg. See specification at page 2, lines 25-27. In contrast, WO '659 is directed to epoxy resin compositions used for coating materials exhibiting reduced Gardner color index and increased blushing properties.

See page 1.. WO '659 does not teach epoxy resin compositions used for producing hard material, much less material having a Tg of more than 80°C after curing at a temperature between 5°C and 60°C. For example, Example 2 of WO '659 does not demonstrate epoxy resin compositions having high Tg. See Formulations 4-4, 5-4 and 6-4 and their pencil hardness set forth in the tables of pages 14, 15 and 16. Material having a pencil hardness of 2H, as described in the tables of pages 14, 15 and 16 of WO '659 does not have high Tg. See <http://en.wikipedia.org/wiki/Pencil>.

(iii). Conclusion

Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

C. Ogawa

The Office Action rejects claims 1-11 and 17-19 under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as having been obvious over U.S. Patent No. 5,075,411 to Ogawa et al. ("Ogawa"). Applicant respectfully traverses the rejection.

(i). Claim 1

As discussed above, claim 1 requires that the epoxy resin composition has a glass transition temperature of more than 80°C after curing at a temperature between 5°C and 60°C. Ogawa does not disclose this feature.

Similar to JP '498 (discussed above), the claimed Tg is an affirmative limitation and Ogawa does not disclose an epoxy resin having a Tg of more than 80°C after curing at a temperature between 5°C and 60°C.

(ii). Claim 4

Claim 4 further recites "for the preparation of the Mannich base, in a first stage at least one phenolic compound of the formula (I) or (II) is reacted with formaldehyde in the presence

of a tertiary amine and in a subsequent stage reaction takes place with at least one polyamine." Table 5 of the specification demonstrates that such features provide superior Tg values over conventional epoxy resin compositions. See MB9 and MB10. The Office Action does not address, and Ogawa does not disclose, such features.

(iii). Conclusion

For at least these reasons, Ogawa does not anticipate and would not have rendered obvious claims 1 and 4. Claims 3, 5-11 and 17 depend from claim 1 and, thus, also are not anticipated and would not have been rendered obvious by the applied references for at least the same reasons discussed above with respect to claim 1. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

V. Rejection Under 35 U.S.C. §103

The Office Action rejects claims 2-8, 12-14, 18 and 19 under 35 U.S.C. §103(a) as having been obvious over JP '498 in view of Golden and further in view of Ogawa. By this Amendment, claim 1 is amended to incorporate the subject matter of claim 2 and claim 2 is canceled. To the extent the rejection is deemed to apply to claim 1, Applicant respectfully traverses.

Deficiencies of JP '498, Golden and Ogawa with respect to claim 1 are discussed above. Claims 3-8, 12-14, 18 and 19 depend from claim 1 and, thus, also would not have been rendered obvious by the applied references for at least the same reasons as discussed above with respect to claim 1. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

VI. Rejoinder

Applicant respectfully requests rejoinder of non-elected claims 15 and 16. Because claims 15 and 16 include all the limitations of claim 1, claims 15 and 16 must be rejoined when claim 1 is found allowable. Because claim 1 is believed to be allowable for at least the reasons

presented above, Applicant respectfully requests withdrawal of the Restriction Requirement and rejoinder of claims 15 and 16.

VII. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachment:

Terminal Disclaimer

Date: April 21, 2010

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